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For:	HAND-HELD DEVICE FOR TRANSFERRING A FILM ONTO A SUBSTRATE AND HAVING AN APPLICATION MEMBER COMPRISING A PLURALITY OF APPLICATION EDGES	Atty. Docket No.:	11349-018-999
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Date: March 14, 2005

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Bezeichnung der Erfindung/Title of the invention/Titre de l'invention:
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A hand-held device for transferring a film onto a substrate and having an application member comprising a plurality of application edges

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09. April 2001

5 **A hand-held device for transferring a film onto a substrate and having an**
 application member comprising a plurality of application edges

The invention relates to a hand-held device according to the preamble of claim 1.

10

A hand-held device of this type is described in publication EP 0 313 719 A2. In this previously known embodiment, the hand-held device comprises according to Fig. 4d a first front application edge arranged approximately mid-centrally in relation to the longitudinal central axis of the application member and a second heel application edge which is offset backwards in relation to the first application edge and formed by a rounded projection forwardly directed, which results between the bottom surface of the application member and a recess in the application member arranged directly behind the front application edge. In this known embodiment, a reference as to arrangement between the application edges and the housing of the hand-held device is not represented. It becomes evident, however, from a comparison with Fig. 1 of said printed publication that the second or rear application edge is covered by the first application edge when it is adjacent to the substrate during operation, wherein the front application edge is at a small distance above the rear application edge. As a result thereof, the view of the rear application edge is obstructed, so that an exact positioning of the film application is hardly possible or at least impaired considerably in this known embodiment.

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It is an object of the invention to facilitate the use of a hand-held device of the type stated in the initial portion, i.e. the user should have a better view of the film application he is about to perform.

30

This object is solved by the features of claim 1. Advantageous developments of the invention are described in the sub-claims.

35 In the configuration according to the invention, the second application edge forms a projection which projects from the application member on its longitudinal side facing the substrate or on its bottom side. This configuration leads to a greater distance between the application edges, which is directed transversely to the application member. When the second application edge is positioned adjacent to the substrate

during operation, the view of the portion of the application member containing the second application edge thus is improved. Therefore a person using the device can apply the film onto the substrate with reduced attention and with an improved positioning accuracy.

5

It is a further advantage to position the first application edge in the upper side portion of the application member or the side portion turned away from the second application edge. Thereby an even greater distance between the application edges is achieved, by which the view of the second application edge is further enhanced.

10

In addition, handling of the hand-held device is improved, in particular when the second application edge exceeds the adjacent lower edge of the housing or the bottom side of the housing.

15

It is a further advantage if the head of the application member is vertically movable or rotatably mounted and pre-tensioned by an elastic restoring force in the lower end position. As a result thereof, the amount of the pressure effective in the operating mode can be limited, namely to the amount of the elastic restoring force. When pressing the application member against the substrate at a force exceeding the restoring force, the pressure member yields by moving upwards. In the absence of said pressure it is automatically moved back into its lower starting position by the elastic restoring force.

20

The invention furthermore proposes features which lead to simple embodiments of small designs, which can be combined with or integrated into the housing of convenient size in an advantageous fashion, which result in good guidance for the backing tape and moreover enable simple and inexpensive manufacture.

25

In the following, the invention shall now be explained in more detail with the aid of drawings and preferred embodiments.

30

Fig. 1 shows a side view of a hand-held device according to the invention in the first position of operation;

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Fig. 2 shows the hand-held device according to claim 1 in a second position of operation;

Fig. 3 shows the hand-held device according to claim 1 in a third position of operation;

Fig. 4 shows an enlarged side view of an application member of the hand-held device;

Fig. 5 shows a top view of the application member according to Fig. 4.

Fig. 6 shows a modified configuration of an application member in a perspective
5 bottom view;

Fig. 7 shows a top view of the application member according to Fig. 6;

Fig. 8 shows a further modified configuration of an application member in a side view;
10

Fig. 9 shows a top view of the application member according to Fig. 8.

The hand-held device 1 comprises a housing 2 of convenient size, which consists of two
longitudinally or transversely divided housing parts 2a, 2b which are mounted to each
15 other in a detachable or non-detachable fashion. The left-hand and lower end of the
housing 2 or the hand-held device 1 in Fig. 1 is its working end 3 at which a preferably
wedge-shaped application member 4 is provided, which is of longitudinal design, held
in the housing 2 by means of a shaft 4a and extends outwardly with an application head
4b following the shaft 4a and projects from the circumference of the housing 2. The
20 longitudinal mid-central axis of the application member 4 is identified by 4c.

In the portion of its application head 4b, the application member 4 has two application
edges 5a, 5b spaced apart from each other at right angles to the longitudinal mid-central
axis 4c and preferably also longitudinally to the longitudinal mid-central axis 4c, which
25 are slightly rounded and extend at right angles to the drawing plane in the working
positions according to Figs. 1 to 3.

In the present exemplary embodiment, the hand-held device 1 serves for transferring a
film 6 of covering and/or coloured and/or adhesive material from a film-like backing
30 tape 7 onto a substrate 8, for example a sheet of paper. The backing tape 7 extends
from a supply 9 located in the cavity of the housing 2 to the application head 4b in the
region of at least one housing aperture 2c, is wound around the application head 4b and
is refed to the cavity of the housing 2. The backing tape section approaching the
application head 4b at the here lower longitudinal or approach side 11a of the
35 application member 4 is identified by 7a. The backing tape section being refed to the
housing 2 at the upper longitudinal or return side 11b of the application head 4b is
identified by 7b. The winding plane E extends roughly in parallel and preferably mid-
centrally to the broad sides 2d of the housing 2, which extend, for example parallel to
each other. The returning backing tape portion 7b extends to a take-up device 12

mounted in the cavity of the housing 2, wherein said take-up device 12 can be a take-up spool 13 which is rotatably mounted in the housing 2. The supply 9, too, can be formed by a spool, namely a supply spool 14 which is rotatably mounted in the housing 2. In the exemplary embodiment the supply 9 and the take-up device 12 are arranged
 5 behind one another, the take-up device 12 being arranged between the supply 9 and the working end 3 of the housing 2.

The embodiment according to the invention enables use of the hand-held device 1 in several positions of operation according to Figs. 1 to 3. In the first position of
 10 operation according to Fig. 1, the hand-held device 1 is set against the substrate 8 with the first application edge 5a and is slightly pressed in such a position in which the second application edge 5b is at a distance from the substrate 8. By moving the hand-held device 1 in the application direction identified by 15, the backing tape section 7a is pulled from the supply 9 due to the friction at the substrate 8, wherein the film 6
 15 remains on the substrate surface and the backing tape section 7b is moved into the cavity of the housing 2, here to the take-up device 12. Said take-up device 12 is driven by the backing tape section 7a approaching the application member 4 or its tensile force. In the present exemplary embodiment this is effected by providing a rotational drive connection 16 between the supply spool 14 and the take-up spool 13, e.g. in the
 20 form of overlapping rubbing surfaces 17a, 17b at the peripheral edges of the walls of the spool. The winding diameter of the spools 13, 14 is dimensioned large enough for the take-up spool 13 to attempt to pull in the backing tape 7, also in case of a full supply spool 14, at a speed which is higher than the speed at which the backing tape 7
 is wound off the supply spool 14. By a slip friction clutch 18 integrated in the
 25 rotational drive connection 16, which here is formed by the rubbing surfaces 17a, 17b which are in frictional contact with one another, it is ensured that the take-up spool 13 pulls in the backing tape 7 always at a certain tensile stress, whereby the formation of loops in the backing tape 7 is avoided. The application movement 15 is directed to the side towards which the bottom side of the application member 4 facing the substrate 8 is
 30 directed.

The second application edge 5b is formed by a projection 19 projecting from the lower longitudinal side of the application member 4 facing the substrate 8 in the mode of
 operation, wherein said projection 19 can have the shape of a web sticking out
 35 transversely, whose mid-central plane 19a encloses an angle $W1$ of approximately 30° to 135° , in particular approximately 90° , with the longitudinal mid-central axis 4c and whose height is referred to by a, which is several times the cross-sectional dimension b of the shaft 4a, preferably about two to three times the dimension b. The front surface 19b turned away from the shaft 4a and the rear surface 19c facing the shaft 4a are

preferably surfaces diverging towards the longitudinal mid-central axis 4c, as a result of which the second application edge 5b is given stability. Between the application edges 5a, 5b, the application head 4b comprises a trough-shaped recess 21 preferably extending at right angles to the winding plane E, said recess 21 being angular-shaped in the exemplary embodiment, in particular at an obtuse angle of about 110°. The flank 22a bordering the first application edge 5a encloses an acute angle W2 with a flank 22b bordering the application edge 5a at the opposite side; said angle W2 can roughly correspond to the angle W3 between the surfaces 19b, 19c of the second application edge 5b and amount, e.g. to about 10° to 20°. Like the second application edge 5b, the first application edge 5a, too, is given stability as a result thereof, particularly with respect to a tensile stress acting upon the first application edge 5a in a transverse direction during operation when the film 6 is applied.

In the present configuration, the second application edge 5b is spaced apart from the first application edge 5a at a distance c extending roughly in parallel to the longitudinal mid-central axis 4c and being offset backwards, which can be about equal to or about half the height a of the second application edge 5b. The distance d of the second application edge 5b from the adjacent border 23 of the housing 2, which extends also in parallel to the longitudinal mid-central axis 4c, can be about equal to or smaller than the distance c.

The height a of the second application edge 5b exceeds the adjacent border 23 of the housing 2. In the present exemplary embodiment, in which the side of the housing 2 facing the substrate 8 (here a narrow side) is designed to be straight in the direction towards its working end, the height a is dimensioned to be large enough for the second application edge 5b to exceed also this side surface 2e of the housing by the measure e. This makes sure that when the hand-held device 1 is pressed against the substrate 8, the second application edge 5b touches the substrate 8 and the housing 2 touches the substrate 8 at a support point 24 which is spaced apart from the second application edge 5b by a distance f which is preferably greater than the distance g at which a pressure D from the second application edge 5b resulting in the mode of operation of the hand-held device 1 acts at the housing. As a result thereof, the hand-held device 1 cannot only be used at an application position according to Fig. 2 - which is inclined with respect to Fig. 1 - , in which the first application edge 5a is spaced apart from the substrate 8, but also in a position in which the housing 2 touches the substrate 8 in accordance with Fig. 3.

At the aperture border facing the substrate 8, a rounded diverting element 26 is formed at the housing 2, preferably in one-part form, at which the backing tape section 7a is

diverted at an obtuse angle and supported. As far as the guidance of the backing tape 7 is concerned before it has arrived at the second application edge 5b and after it leaves the first application edge 5a, guiding webs 27a, 27b are provided, which project from the approach side 11a and the return side 11b, respectively, and which have between
 5 them a distance conforming to the width of the backing tape 7, so that the inner sides of the guiding webs 27 form guiding surfaces for the backing tape 7. The guiding web(s) 27 provided at the approach side 11a extend to the adjacent outer surface 25 of the housing 2 at the border of the aperture, by taking account of clearance, whereby the lower aperture region is largely covered laterally.

10

The application member 4 can be held in the housing 2 so rigidly and can be designed to be so inflexible that the application edges 5a, 5b are basically immovable in a direction transverse to the longitudinal mid-central axis 4c.

15

The application member 4, however, can also be designed or arranged such that its application head 4b is movable towards the side turned away from the second application edge 5b against an elastic restoring force and is returned into its starting position by the restoring force. The appertaining region of movement is identified by B. The size of the housing aperture 2c is dimensioned accordingly. The restoring force
 20 is preferably great enough for the application head 4b to evade elastically when the pressing force exceeds a non-detrimental value during transferring of the film 6, whereby a detrimental pressing force is avoided. This movability can be ensured by the shaft 4a being elastically flexible in front of its rear point of attachment or by the application member 4 as a whole being rotatably mounted in the housing 2 about a
 25 swivel axis arranged in the rear portion of the shaft 4a and being able of being reset into its represented starting position by a not represented restoring spring.

30

It is a further advantage to design the shaft 4a of the application member 4 to be elastically torsional or rotatable about its longitudinal axis in front of its rear point of attachment. As a result thereof, the application edges 5a, 5b can adapt to different
 positions of the substrate 8 in case of inclinations of the hand-held device 1 and return automatically into their average swivelling position in the absence of pressure due to their elasticity.

35

The exemplary embodiment according to Figs. 6 and 7, in which the same or similar parts are given the same reference numbers, differs from the exemplary embodiments described in the foregoing in several respects.

On the one hand, the application member 4 comprises a third application edge 5c, which is preferably arranged mid-centrally between the first application edge 5a and the second application edge 5b, the mid-central plane thereof enclosing an angle of approximately 45° with the longitudinal mid-central axis 4c or the first application edge 5a. The third application edge 5c thus projects diagonally to the front from the lower longitudinal side 11a of the application member 4. The third application edge 5c, too, can have a wedge-shaped cross-sectional shape. In the exemplary embodiment according to Figs. 6 and 7, the heights of the first and second application edges 5a, 5b according to Fig. 1 or 4 and the height of the third application edge 5c can correspond to the height a of the second application edge 5b. It is also possible that all the three application edges 5a, 5b, 5c are identical in height, so that their free ends are spaced apart from a mid-central transverse axis 4d of the shaft 4a sketched out in Fig. 6 by the same distance and thus are located on an imaginary cylinder section plane curved around the swivel axis 4d.

On the other hand, the shaft 4a has at its rear end on one or on both sides a transversely protruding support pin 31 of a non-circular, preferably rectangular or square, cross-section, with which it engages into a correspondingly shaped non-circular plug recess 32 of the housing 2 and is anchored therein in a form-fit fashion. Thereby the shaft 4a can be held in the housing in a simple manner, wherein, in the event of the shaft 4a being composed of elastically flexible material, the shaft 4a can be bent out elastically with the application head 4b in the winding plane E. The at least one plug recess 31 is preferably positioned such that the shaft 4a is in its spring-neutral mid-central position in the lower portion of the area of movement referred to by B in Fig. 4. In this exemplary embodiment, too, the application head 4 can bend upwards elastically. The plug recesses 32 are formed to be attached in one part to the housing 2 or the housing parts 2a, 2b and can be bordered by walls protruding inwards from the housing wall, as is illustrated in Fig. 7.

The third application edge 5c enables the use of the hand-held device 1 in an area between the positions according to Figs. 1 and 2. In order to enable trouble-free sliding of the backing tape 7, the application edges 5a, 5b, 5c are rounded in the form of a cylindrical segment.

The shaft 4a can have the shape of a bar, e.g. round or square or the like, as is shown in Figs. 4 and 5, or it can be designed to be edge-shaped, as is illustrated in Fig. 6 and following, in which the horizontal width k of the shaft 4a is many times its thickness l. In both embodiments, the application head b is elastically torsional due to the length of the shaft 4a and its elasticity, so that the application edges 5a, 5b, 5c adapt to the

surface of the substrate 8 when subjected to pressure in the mode of operation and, in the absence of pressure, bend back elastically into their neutral position due to the elasticity.

- 5 The flexibility and/or torsional ability of the shaft 4a is increased or mainly focussed on or restricted to a certain area of length when the shaft 4a comprises a necking 33, which can be designed e.g. according to the exemplary embodiment as shown in Figs. 8 and 9. In this configuration, the shaft 4a is necked by two recesses 34 arranged opposite to each other and which can be formed by slots whose width m is about equal or greater
10 than the thickness b of the shaft 4a. The base of the slits is preferably rounded in a concave fashion. In the present exemplary embodiment, the recesses 34 limit the shaft 4a in the region of the necking 33 to a width k_1 , which is about equal or greater than its thickness b . The necking 33 can follow directly to the support pin 31, or the recesses 34 can be spaced apart from the support pins 31 by a preferably low axial distance.
15 Moreover, the application head 4b in the exemplary embodiment according to Figs. 8 and 9 is designed in conformity with the exemplary embodiment according to Fig. 4.

- The design of the rear end portion of the shaft 4a with at least one support pin 31 and the necking 33 can be effected in all the above-described exemplary embodiments or
20 also in application members of other configurations.

- It is possible within the framework of the invention to drop the application edge 5b in the exemplary embodiment according to Figs. 6 and 7 and to design the application member 4 only with the application edge 5a and an application edge 5c extending at an
25 acute angle thereto according to Fig. 6. It is also possible to achieve the advantages described, at least to some extent, in such an application member 4 with two application edges.

- The application member 4 and preferably also the housing 2 and the spools 13, 14 are
30 preferably die-cast parts, especially of plastic material. This enables fast and inexpensive manufacture of accurate parts also in case of difficult shapes.

09. April 2001

Claims

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1. A hand-held device (1) for transferring a film (6) of for example adhesive, covering or coloured material from a backing tape (7) onto a substrate (8), said device having a housing (2) in which a supply (9) of the backing tape (7) is arranged and an application member (4) which projects from the housing (2) and has at least a first and a second application edge (5a, 5b), the backing tape (7) being wound around the free end and the application edges (5a, 5b) of the application member (4) and extending into the housing (2) with tape sections (7a, 7b) at the lower longitudinal side (11a) facing the substrate (8) during the mode of operation and at the upper longitudinal side (11b) opposite said lower longitudinal side/surface (11a),

15

characterised in

that the second application edge (5b) projects from the lower longitudinal side (11a) of the application member (4).

20

2. A hand-held device according to claim 1, characterised in

that the mid-central planes (4c, 19a) of the application edges (5a, 5b) enclose an angle (W1) of approximately 30° to 120°; preferably about 45° to 90°, between them.

25

3. A hand-held device according to claim 1 or 2, characterised in

that a third application edge (5c) projects from the lower longitudinal side (11a) of the application member (4) between the first and second application edges (5a, 5b).

30

4. A hand-held device according to anyone of the preceding claims, characterised in

that the height (a) of the second and/or third application edge (5b, 5c) is greater than the cross-sectional dimension (b) of the first application edge (5a) or a shaft (4a) of the application member (4).

35

5. A hand-held device according to anyone of the preceding claims, characterised in

that the cross-sectional shape of the second and/or third application edge (5b) is convergent, in particular wedge-shaped.

- 5 6. A hand-held device according to anyone of the preceding claims,
characterised in
that the second application edge (5b) exceeds the adjacent lower border (23) of
the housing (2) or its bottom side (2e).
- 10 7. A hand-held device according to anyone of the preceding claims,
characterised in
that the front end portion of the application member (4) is movable upwards
against an elastic restoring force.
- 15 8. A hand-held device according to claim 7,
characterised in
that the rear end portion of the application member (4) is fixedly held in the
housing (2) and the application member (4) is elastically flexible in a vertical
direction in at least a partial area of its length.
- 20 9. A hand-held device according to anyone of claims 1 to 6,
characterised in
that the application member (4) is rotatably mounted about a swivel axis
extending in the housing (2) upwards against an elastic restoring force.
- 25 10. A hand-held device according to anyone of the preceding claims,
characterised in
that at least one guiding web (27b) projects backwards from the backside of the
second application edge (5b) on one or on both sides, said guiding web (27b)
constituting with its inner side a guidance for the backing tape (7) being wound
30 around the second application edge (5b).
11. A hand-held device according to anyone of the preceding claims,
characterised in
that the second application edge (5b) is offset backwards in relation to the first
35 application edge (5a) and/or the third application edge (5c).
12. A hand-held device according to anyone of the preceding claims,
characterised in

that the first application edge (5a) is the front end of a longitudinal, preferably straight extending, shaft (4a) of the application member (4).

- 5 13. A hand-held device according to anyone of the preceding claims, characterised in that the first application edge (5a) has a necking (33) preferably in its rear end portion.

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Abstract

09. April 2001

- 5 The invention relates to a hand-held device (1) for transferring a film (6) of for example adhesive, covering or coloured material from a backing tape (7) onto a substrate (8), said device having a housing (2) in which a supply (9) of the backing tape (7) is arranged and an application member (4) which projects from the housing (2) and has a first and a second application edge (5a, 5b), the backing tape (7) being wound around
- 10 the free end and the application edges (5a, 5b) of the application member (4) and extending into the housing (2) with tape sections (7a, 7b) at the lower longitudinal side (11a) facing the substrate (8) during the mode of operation and at the upper longitudinal side (11b) opposite said lower longitudinal side (11a). For improvement of the view to the film application during the mode of operation, the second application edge (5b)
- 15 projects from the lower longitudinal side (11a) of the application member (4).

(Fig. 1)

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Fig. 1

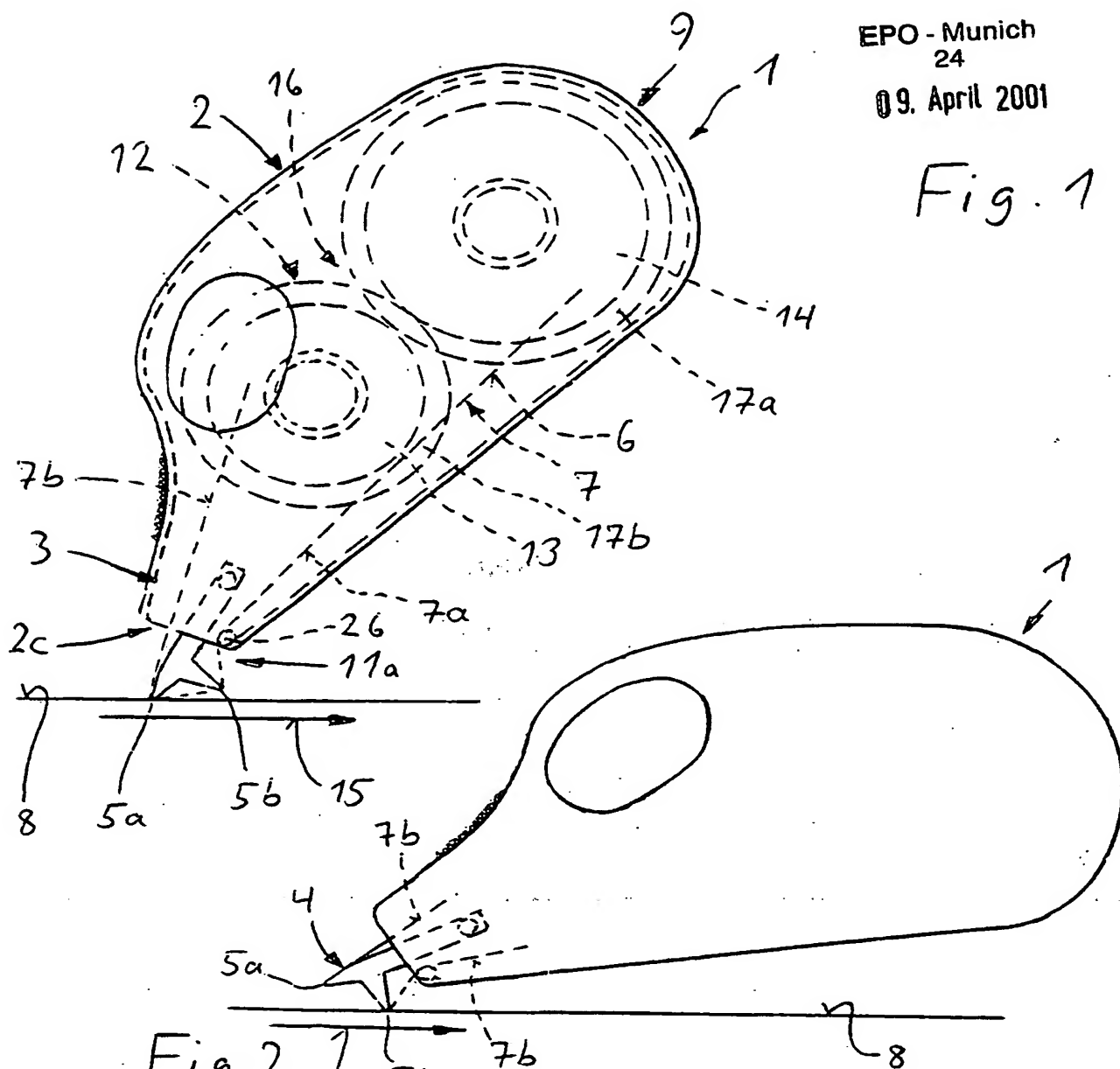
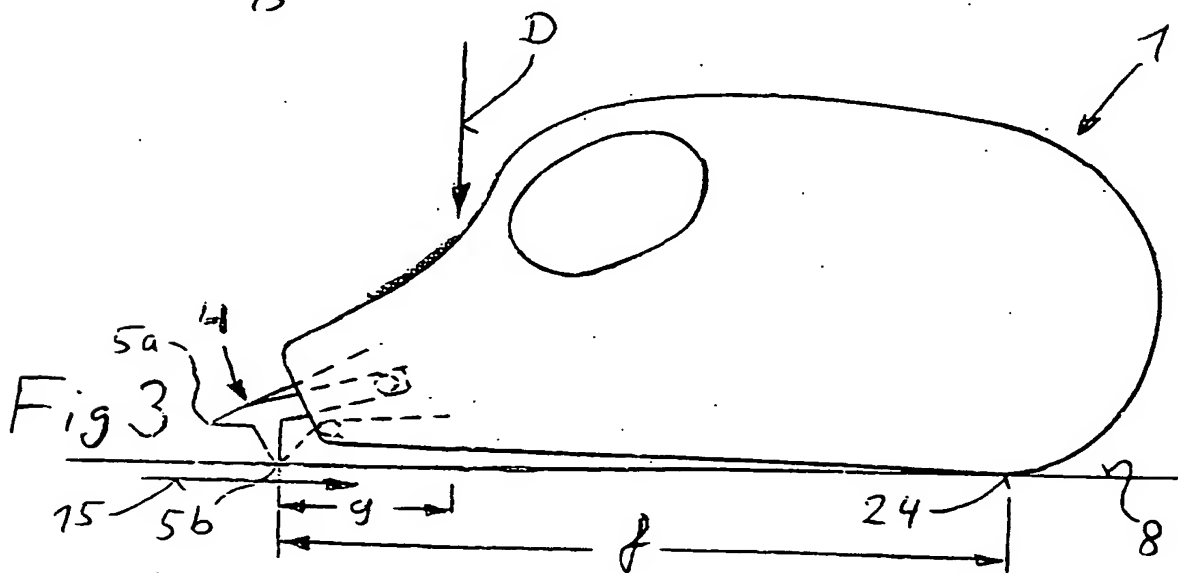
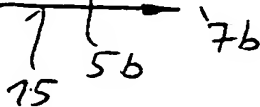
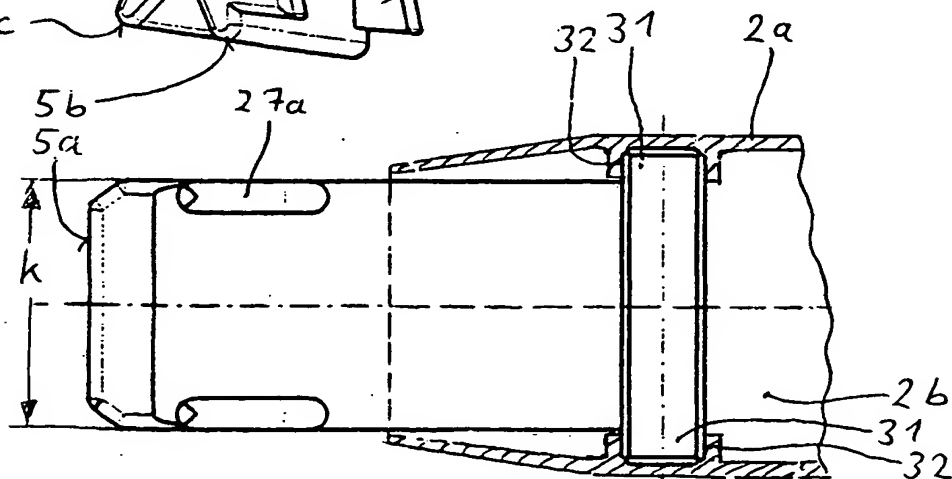
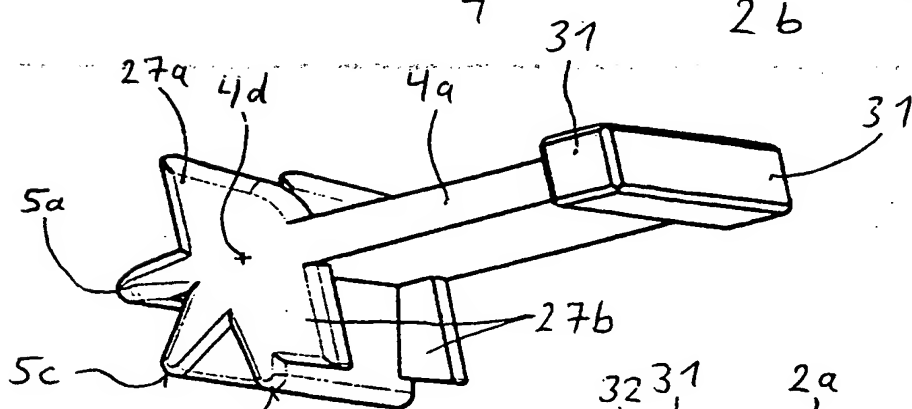
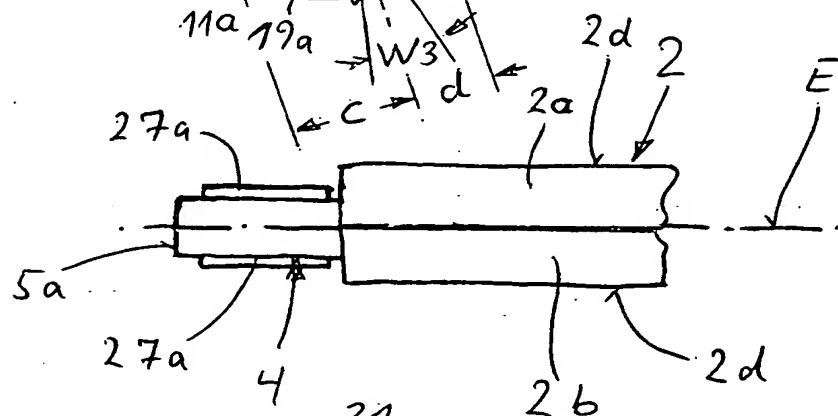
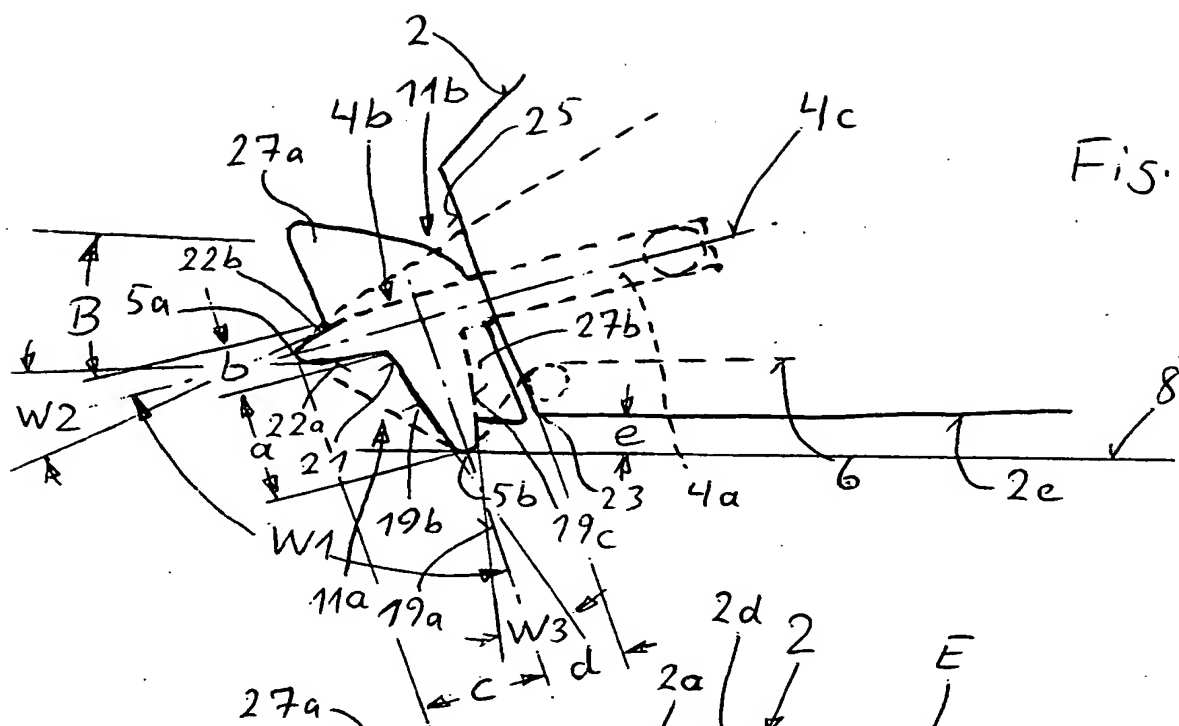


Fig. 2





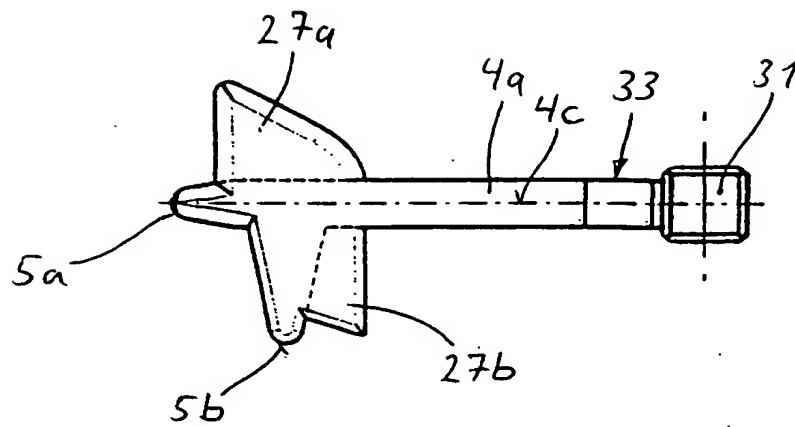


Fig. 8

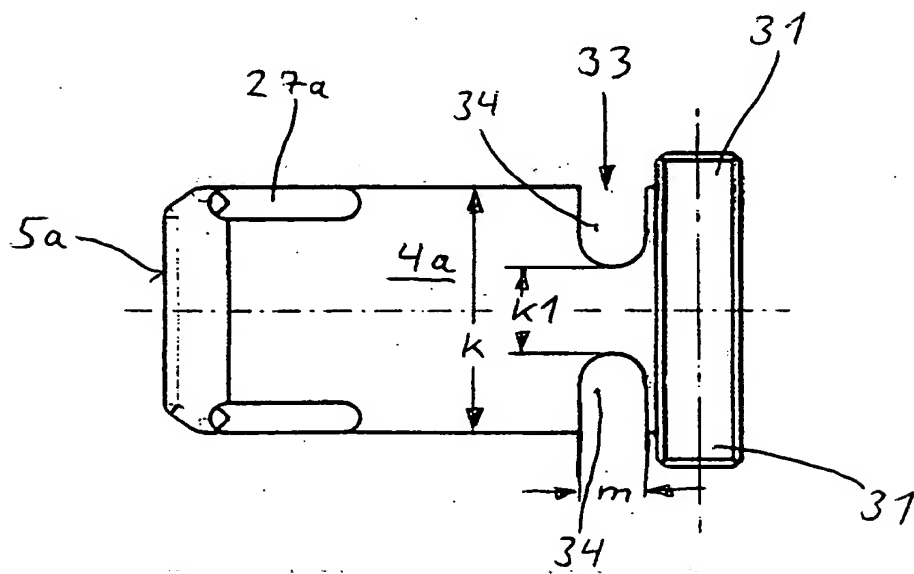


Fig. 9

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